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FOREST SERVICE - U. S. DEPARTMENT OF AGRICULTURE

PACIFIC SOUTHWEST
FOREST AND RANGE
EXPERIMENT STATION
BERKELEY - CALIFORNIA

RESEARCH NOTE

No. 203

1962

CALIFORNIA CONE CROP—1962[1/]

By

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ABSTRACT: Good crops of most forest tree seeds are predicted in 1962 on the basis of summaries of field reports as of mid-July. At one extreme sugar pine had a "bumper crop"; at the other, incense-cedar failed. Scattered medium-sized crops were reported on ponderosa and Jeffrey pines, Douglas-fir, and the true firs.

Good crops of most forest tree seeds will be available for collection this fall, according to a mid-July 1962 summary of field reports submitted by members of the California Division of Forestry and the U.S. Forest Service. Sugar pine seems to have a "bumper crop"--as was expected because large numbers of first-year cones were reported in 1961. Douglas-fir cones are abundant but mostly on the Sierra variety; scattered good crops on the Coast variety occur in the Van Duzen-Mad River area. Ponderosa and Jeffrey pine cones are moderately abundant in scattered localities. Incense-cedar has few, if any, cones anywhere. Since cone crops may vary considerably from place to place it is advisable to consult field offices of the California Division of Forestry or the U. S. Forest Service to find suitable cone collection areas.

Cone beetles are about as active as they were last year on sugar pine throughout its range but should not reduce the crop seriously. Some insect damage on Jeffrey pine in the northeast plateau has been reported, but there seems to be little or no damage to the ponderosa pine cone crop.

1/ In cooperation with the California Division of Forestry and Region 5, U.S. Forest Service.

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The true firs probably have their usual quota of cone insects but no definite reports had been received by mid-July. On Douglas-fir, the intensity of insect damage generally varies inversely with the abundance of cones.

Crop Rating System

All field reports used a system devised cooperatively by the Experiment Station and Region 5 of the Forest Service in 1960. Fowells and Schubert[2/] had shown that during a 25-year period in California the bulk of each year's cones were borne on the large, dominant trees of the stand. Therefore, in the current system each locality is rated on the basis of ocular estimates of the cones on seed trees (dominant trees larger than 12 inch d.b.h. with a full crown). Each species on the area is assigned one of the following numbers:

1--None, no cones on any seed trees.

2--Very light, a few cones on less than one-fourth of the seed trees.

3--Light, a few cones on more than one-fourth of the seed trees.

4--Medium, many cones on one-fourth to one-half of the seed trees.

5--Heavy, many cones on more than half of the seed trees.

The reports for the major species of forest trees were distributed as follows:

Species	Crop rating (Percent of reports)					Number of reports
	1	2	3	4	5	
Ponderosa pine	22	43	14	19	2	146
Jeffrey pine	25	39	19	14	3	112
Sugar pine	2	10	19	29	40	147
Douglas-fir	19	34	16	24	7	102
Red fir	28	22	22	20	8	74
White fir	45	20	11	12	12	166
Incense-cedar	39	43	11	5	2	61

2/ Fowells, H. A., and Schubert, G. H. Seed crops of forest trees in the pine region of California. U.S. Dept. Agr. Tech. Bul. 1150, 48 pp., illus. 1956.

Cone Collection Areas

Table 1 summarizes reports for each species according to the forest tree seed collection zones described by Fowells (see attached map).[3] Additionally, as in 1961, the zone summaries have been subdivided arbitrarily by counties to provide reference lines which already have been delineated on most maps. Moreover, increased interest in collecting seeds of a wide variety of species that grow outside the present zone boundaries has stressed the need for information from the entire State. To meet this need, we set up provisional extensions of the existing zones into adjoining counties:

Seed zone additions	Areas involved
IA	Lassen County, outside Zone I
VIA	Inyo County, outside Zone VI
XA	Lake County, outside Zone X
IXA	These counties, outside of Zone IX: San Luis Obispo, Kern, San Bernardino, Santa Barbara, Ventura, Los Angeles, Riverside, San Diego, Imperial
XIIIA	These counties, outside of Zone XIII: Mendocino, Sonoma, Napa, Marin, Contra Costa, Alameda, San Mateo, Santa Clara, San Benito, Santa Cruz, Monterey
XIV	Remainder of State (Central Valley)

Evaluation of 1961 Crop

The 1961 seed production was generally poor, as predicted. Insects destroyed most of the few cones which did develop. A summary of insect damage can be found on page 9 of "Forest Pest Conditions in California--1961." This is the official report of the California Forest Pest Control Action Council, and is published by the California Division of Forestry.

For the second year, the new crop estimate forms served their purpose well. Use of these forms standardized the rating procedures, made it easier to submit reports, increased the number of reports, simplified summarization, and speeded publication of the cone crop estimates. To serve any useful purpose there must be a large number of reports and they must be submitted promptly. Hall and Eaton[4] have shown the effectiveness of

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3/ Fowells, H. A. Forest tree seed collection zones in California. U.S. Forest Serv. Calif. Forest and Range Expt. Sta. Res. Note 51, 5 pp., illus. 1946.

4/ Hall, R. C., and Eaton, C. B. Cooperative forest insect detection reports for California, for the calendar year 1959. U.S. Forest Serv. Pacific SW. Forest and Range Expt. Sta. Res. Note 170, 8 pp., illus. 1960.

statewide submission of insect detection reports for revealing outbreaks. It is hoped that cone crop estimates can be as effective in revealing annual tree seed potentials. Additional cooperators to furnish cone crop reports would be welcomed.

Table 1.--Summary of cone crops by species, seed zone, and county, California, 1962

Major species	Seed zone	Average rating[1]	Number of reports	County-zone ratings[2]
Ponderosa pine (Pinus ponderosa)	I	3.6	16	Lassen - 4.3; Modoc - 4.0; Siskiyou - 3.8 Nevada, Plumas - 3.0
	II	2.0	11	Sierra - 3.0; Shasta - 2.3
	III	1.5	43	Shasta - 2.7; Sierra - 2.5; Plumas - 2.1
	IV	2.2	22	Mariposa - 2.5; Tuolumne 2.4 Tulare - 2.2
	V	2.5	20	Tuolumne - 2.7; Tulare - 2.2
	VII	4.0	1	Plumas
	IX	2.4	10	Ventura - 5.0
	IXA	2.3	3	Kern - 2.3
	X	2.2	27	Siskiyou, Trinity - 2.5
	XI	1.5	4	Humboldt - 3.0
Jeffrey pine (Pinus jeffreyi)	I	2.7	11	Lassen - 4.5; Nevada, Sierra - 3.0 Plumas - 2.2
	III	1.8	19	Sierra - 3.0
	IV	2.4		Mariposa - 3.0; Madera - 2.7 Tulare, Tuolumne - 2.2
	V	2.6	16	Calaveras - 4.0; Tuolumne 2.8
	VI	4.0	1	Inyo
	VII	2.5	4	Plumas - 3.0; Sierra - 2.5
	VIII	3.5	4	Tuolumne - 3.8
	IX	2.0	28	San Diego - 4.0; Ventura 3.0 San Bernardino - 2.2
	IXA	2.3	3	Kern - 2.3
	X	1.7	6	--

Table 1.--Summary of cone crops by species, seed zone, and county, California, 1962, continued

Major species	Seed zone	Average rating[1]	Number of reports	County-zone ratings[2]
Sugar pine (Pinus lambertiana)	I	4.4	5	Shasta, Siskiyou - 5.0 Lassen, Sierra - 4.0
	II	3.5	9	Butte, Shasta, Yuba - 5.0 El Dorado, Sierra - 4.0 Nevada - 3.0
	III	3.7	39	Placer, Sierra - 4.5 El Dorado, Plumas - 4.0 Shasta - 3.7; Nevada - 3.0
	IV	3.6	21	Tulare - 4.5; Calaveras, Mariposa - 4.0 Tuolumne - 3.6; Madera - 2.7
	V	4.2	22	Tulare - 4.6; Tuolumne - 4.3 Madera - 2.5
	IX	3.4	18	San Bernardino - 4.2; Los Angeles - 3.6 Riverside - 2.7
	X	4.3	15	Glenn, Tehama - 5.0; Trinity - 4.5 Shasta, Siskiyou - 4.0 Lake, Mendocino - 3.5
	XI	3.0	6	Siskiyou - 3.0
Douglas-fir (Pseudotsuga menziesii)	I	2.5	4	Lassen, Siskiyou - 3.0
	II	3.2	10	Yuba - 5.0; Nevada, Sierra - 4.0 Shasta - 3.7; El Dorado - 3.0
	III	1.7	30	Sierra - 4.5; Nevada - 4.0; Plumas - 2.1
	IV	3.0	2	Tulare - 3.0
	V	3.8	5	Calaveras - 4.0; Tuolumne - 3.7
	X	2.8	38	Mendocino - 4.0; Shasta - 3.3 Lake, Siskiyou - 3.0; Trinity - 2.6
	XI	2.5	16	Humboldt - 3.3; Siskiyou - 2.1
	XII	2.7	3	Humboldt - 3.0

Table 1.--Summary of cone crops by species, seed zone, and county, California, 1962, continued

Major species	Seed zone	Average rating 1/	Number of reports	County-zone ratings 2/
Incense-cedar (Libocedrus decurrens)	I	2.0	4	Siskiyou - 3.0
	II	1.7	3	--
	III	1.1	11	--
	IV	2.4	11	Tuolumne - 2.6
	V	2.1	13	Tuolumne - 2.1
	IX	1.8	12	Riverside - 2.1
	X	2.7	3	Mendocino - 5.0; Lake - 2.1
Red fir (Abies magnifica)	I	2.7	10	Nevada - 4.0; Siskiyou - 3.3 Lassen - 3.0
	II	2.5	10	Nevada - 4.0; Shasta - 2.4
	III	3.9	11	Plumas - 4.3; Nevada - 4.0 El Dorado, Placer - 3.0
	IV	1.0	4	--
	V	2.4	16	Tuolumne - 3.7; Tulare - 2.1
	VI	2.0	1	--
	VII	3.1	7	Nevada, Plumas, Sierra - 3.0
	VIII	3.5	2	Tuolumne - 3.5
	IX	1.4	5	--
	IXA	1.0	2	--
	X	1.6	5	Mendocino - 3.0
White fir (Abies concolor)	I	2.3	16	Nevada - 4.0; Siskiyou - 3.7 Lassen - 3.3
	II	2.8	8	Shasta - 4.0; El Dorado, Sierra - 3.0
	III	1.6	40	El Dorado, Placer - 3.0
	IV	3.0	16	Calaveras - 5.0; Tuolumn 4.7 Mariposa - 4.0; Madera - 2.5
	V	2.9	24	Calaveras - 5.0; Tuolumn 4.3 Madera - 3.5; Tulare - 2
	VI	2.0	1	--
	VII	3.2	5	Sierra - 3.3; Plumas - 3
	VIII	4.5	2	Tuolumne - 5.0; Alpine -
	IX	1.7	32	San Diego - 3.7

Table 1.--Summary of cone crops by species, seed zone, and county, California, 1962, continued

Major species	Seed zone	Average rating[1]	Number of reports	County-zone ratings[2]
White fir, con. (Abies concolor)	IXA	1.0	3	--
	X	1.8	8	Mendocino - 3.0
	XI	2.0	3	--
Redwood (Sequoia sempervirens)	XII	5	1	Del Norte
Giant sequoia (Sequoia gigantea)	IV	3.3	3	Calaveras - 4.0; Tulare - 3.0

Minor species	Seed zone	Average rating[1]	Number of reports	County-zone ratings[2]
PINES:				
Lodgepole pine, or Beach pine (P. contorta)	I	4.0	2	Plumas - 5.0; Lassen - 3.0
	III	4.0	3	Plumas - 4.0
	V	2.6	5	Tulare - 3.0; Tuolumne - 2.7
	VII	4.0	2	Nevada - 4.0
	VIII	2.2	4	Alpine - 3.1
Western white pine (P. monticola)	V	4.7	3	Tulare, Tuolumne - 5, Fresno - 4.0
	VIII	3.5	2	Tuolumne - 3.5
Coulter pine (P. coulteri)	IX	2.9	9	Los Angeles, San Bernardino San Diego, Santa Barbara - 3.0
	IXA	2.5	2	Santa Barbara - 3.0
	XIIIA	2.0	1	--
Knobcone pine (P. attenuata)	IXA	4	1	San Luis Obispo
	X	5	1	Mendocino
Whitebark pine (P. albicaulis)	VIII	1.5	2	--
Single leaf pine (Pinyon) (P. monophylla)	IX	5.0	1	Ventura
Digger pine (P. sabiniana)	II	5.0	1	Sierra
	XIV	4.0	1	Butte

Table 1.--Summary of cone crops by species, seed zone, and county, California, 1962, continued

Minor species	Seed zone	Average rating 1/	Number of reports	County-zone ratings 2/
OTHERS:				
Bigcone Douglas-fir (Pseudotsuga macrocarpa)	IX	3.7	6	San Diego - 4.7; Los Angeles - 4.0
	IXA	2.0	1	--
Bristlecone fir (Santa Lucia fir) (Abies venusta)	XIIIA	4.0	1	Monterey
Mountain hemlock (Tsuga mertensiana)	V	3.0	1	Tuolumne
	VIII	2.5	2	Tuolumne
Western juniper (Juniperus occidentalis)	VIII	2.7	3	Tuolumne

1/ Based on the numerical scale: 1 = none; 2 = very light; 3 = light; 4 = medium; 5 = heavy.

2/ Only counties with reports higher than 2.0 are shown.

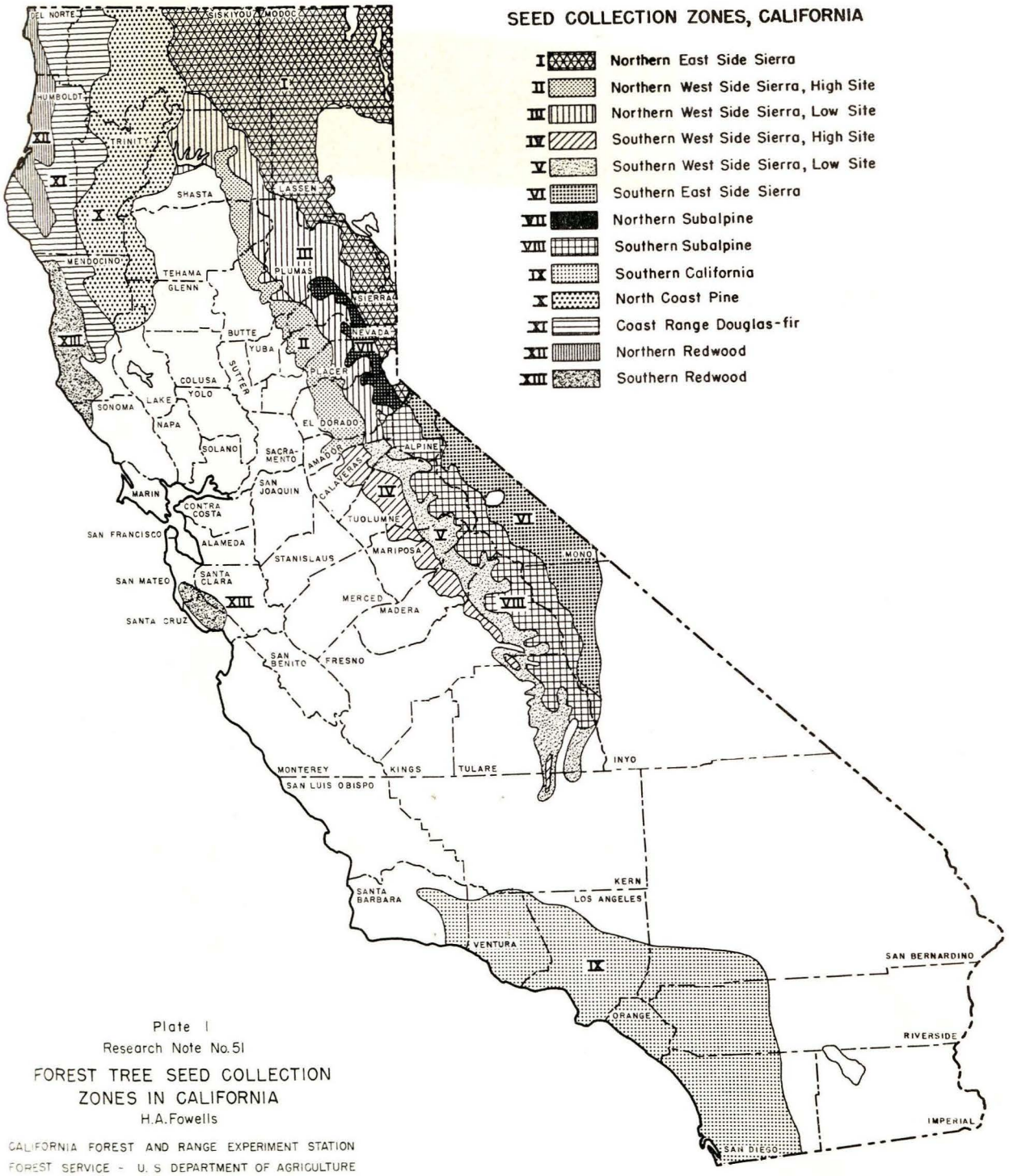

Plate I

Research Note No. 51

FOREST TREE SEED COLLECTION ZONES IN CALIFORNIA

H.A. Fowells

CALIFORNIA FOREST AND RANGE EXPERIMENT STATION

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